BEFORE THE PUBLIC UTILITIES COMMISSION OF THE

STATE OF HAWAII

In the Matter of PUBLIC UTILITIES COMMISSION Instituting a Proceeding to Investigate the Implementation Of Feed–in Tariffs.	DOCKET NO. 2008-0273

CLEAN ENERGY MAUI'S OPENING BRIEF AND PROPOSED FEED-IN TARIFF

AND

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CLEAN ENERGY MAUI'S OPENING BRIEF AND PROPOSED FEED-IN TARIFF

Clean Energy Maui LLC ("CEM") respectfully submits this Opening Brief in support of Clean Energy Maui's proposed Feed-in Tariff (attached as Exhibit A) and answering most of the questions set forth in the memorandum prepared by National Regulatory Research Institute and transmitted to the parties on May 7, 2009 (the "NRRI Questions"), in the above-referenced docket. Being an engineer, I apologize for not answering several legal questions and refer to the opinions of the better-qualified lawyers in this docket.

What can we learn from the history of the FIT in other countries?

The purpose of a Feed-in Tariff is the rapid changeover to renewable energy sources.

The German FIT law states the reasons eloquently and clearly: "The purpose of this act is to facilitate a sustainable development of energy supply, particularly for the sake of protecting our climate, nature and the environment, to reduce the costs of energy supply to the national economy, also by incorporating long-term external effects, to protect nature and the environment, to contribute to avoiding conflicts over fossil fuels and to promote the further development of technologies for the generation of electricity from renewable energy sources."

The FIT achieves this objective by creating circumstances in which a new renewable energy industrial sector can be formed. As seen in Germany and elsewhere, the current players in the energy market are usually not willing or able to rapidly switch their operations to renewable energy and therefore this task falls to companies that have the necessary creativity and courage to create and deploy fossil-fuel-free technologies. In fact, small and medium-size companies created most of the initial FIT installations in Germany. The established energy companies missed the opportunity - at least initially.

The FITs in Germany and many other countries were installed as a law by parliament, often in a extended legal battle with the transmission companies that understood it as an attack on their assured market share and their fossil-fuel-based central planning.

But free market entrepreneurialism trumps central planning and that is the real power of the FIT.

The issue of technical limitations and small island grids

For 17 years the IRP planning process has produced numerous studies and opinions but not even clarity about the grid limitations on variable renewable energy and how to counter them. The introduction of new energy sources on any grid certainly presents problems and integration issues. This is true in any grid size and amplified in small island grids. But that is not a reason to shun renewable energy. We should see it as an interesting challenge. Good engineers get inspired by problems, not discouraged.

What is missing from the discussion is a clear plan and visible determination from the utility to solve the grid issue. Instead, the weak grid continues to be an argument that warrants limits on renewable energy use.

Germany's FIT law introduces a policy forcing improvements to the grid. The law states: "A grid shall be deemed to be technically suitable even if feeding in the electricity requires the grid system operator to upgrade its grid at a reasonable economic expense; in this case, the grid system operator shall upgrade its grid without undue delay, if so requested by a party interested in feeding in electricity." If a similar provision would be placed in Hawaii's FIT, modifications to the substations (such as load tap changers) and other grid infrastructure would be triggered automatically and the quality of the grid would continually improve.

It is important to recognize that there are both firm and variable renewable energies proposed in the FIT. There is no valid argument as to why firm renewable energy sources should be limited or treated any different than fossil firm energy sources. They may need to be built in such a way that they provide the same grid services as the fossil fuel generators they replace.

There is a limit to how much variable renewable energy each island grid can handle as a whole. The Intervener's FIT recommends an initial cap of 25% of island-wide peak load for wind generation and 20% of island-wide peak load for solar generation. With increased understanding of the issues, this cap could be raised. HELCO and MECO have had good success with modifications to generators and the Energy Management System ("EMS") to improve that amount. A wide geographic distribution of renewable energy installations will also reduce short-term variability, because sun and wind conditions do not change at the same time throughout the island. The best solution is the introduction of electric storage. CEM recommends a battery feed-in tariff to assure the development of storage facilities and therefore making true progress in grid stability. If we really want to make large-scale progress with renewable energy in Hawaii, we need to tackle storage right away and the BFIT is the most powerful way to do so.

Battery Feed-in Tariff (BFIT)

Clean Energy Maui LLC has developed the BFIT with the help of numerous advisers in the renewable energy community and discussed it with HECO engineers.

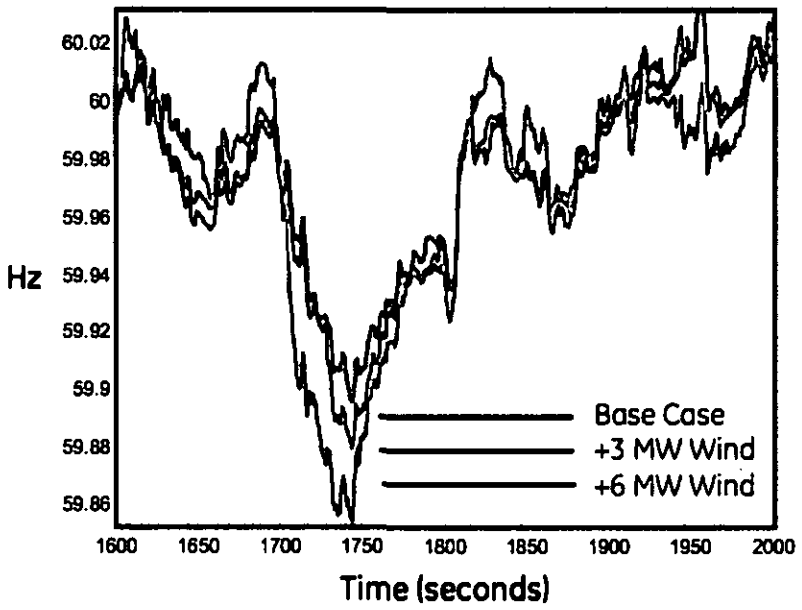
a) The need for grid stabilizing measures

In Hawaii's small grids the use of grid stabilizing measures is of paramount importance for the growth of variable renewable energies such as wind and solar. The output of a solar energy system can drop as much as 60% when a cloud passes over it and wind energy fluctuates constantly. The existing regulating resources in the grid can handle a certain amount of these variations, but already the grid on the Big Island of Hawaii is approaching it's limits.

Here are two diagrams, excerpts from General Electric's presentation at the Stakeholder Summit at the Waikoloa Beach Marriott, September 27, 2007 on their PSLF ™ simulation of the Big Island system.

Example: What if HELCO had More Wind?

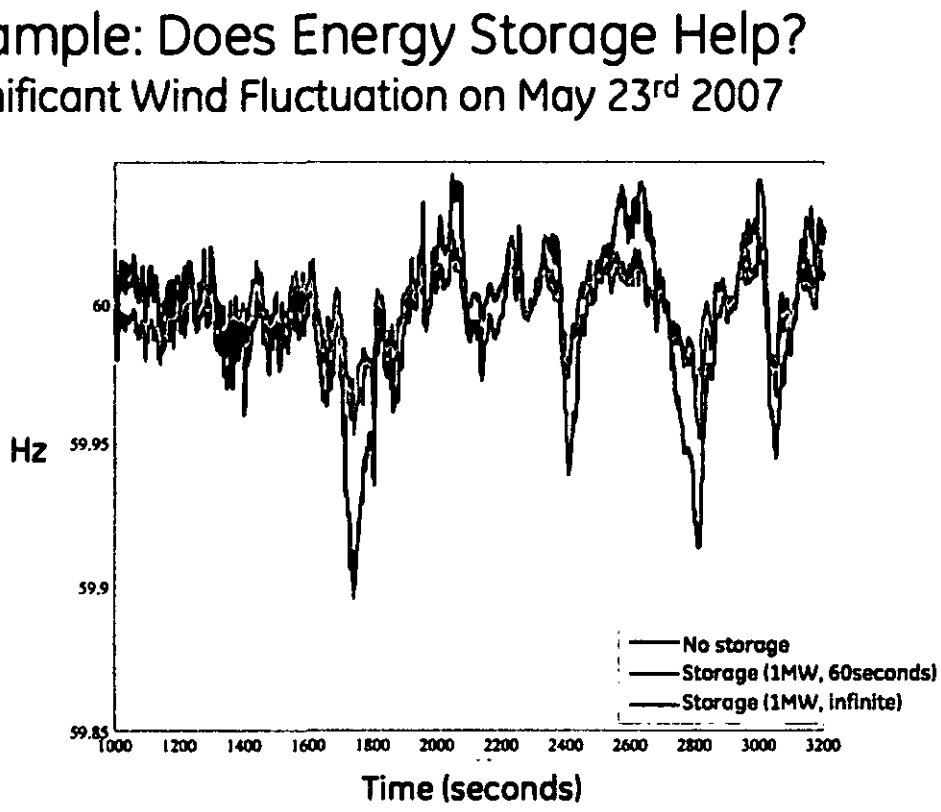
Significant Wind Fluctuation on May 23rd 2007



This graph depicts one of the most intense wind fluctuations at the Apollo Wind Farm. As the wind speed decreases, the system frequency drops. The blue line (upper line) shows the impact of the existing wind farm, which dropped frequency from 60 Hz to 59.9 Hz. The red line (lowest line) shows the simulated impact for a 6 MW addition, which drops frequency from 60 Hz to 59.85. The drop is 50% higher for a relatively small addition of 6 MW of power. This suggests that a limit for wind on the Big Island has been reached without storage.

b) How storage can help

The following graph depicts a simulation of the same situation with the use of battery storage. The time scale is different.



The simulation clearly shows the beneficial effect of storage on the stability of the grid. Without storage, the frequency drops from 60 Hz to 59.9 at 17:50. Storage reduces the drop to 50% of

that. Even more important, this extraordinary fluctuation is now reduced into the range of normal variations on the grid. Clearly, more wind can be installed on the Big Island with the addition of storage. Also, grid-based storage is more desirable than project-based storage because it provides grid services.

c) Battery Feed-in Tariff (BFIT)

Clean Energy Maui has developed the world's first storage FIT, based on specific need on the Hawaiian Islands. It is meant to include all kinds of electricity storage. Utility-size battery technology is still very limited in scope, with the biggest installations currently in Japan. Pumped storage is a mature technology with complex siting problems. Vehicle-to-grid (V2G) technology is proposed for the future. We feel that a Hawaii BFIT would be of great benefit in stabilizing our grids while keeping the investment costs and risks away from HECO and ratepayers. In the bigger picture, a BFIT could jump-start the utility battery sector by giving financing opportunities in the tens or hundreds of millions of dollars.

Maui and the Big Island currently have a surplus of energy at night that gets curtailed at the cost of the wind farms and is lost forever. This results from grid control issues. The wind farm in Maui produces up to 30 MW. During daytime this is around 15% of the grid and it's variability can be controlled with the existing diesel generators at Ma'alea. At night the grid runs as low as 60 MW and the wind produces up to 50% of the energy. Due to generator control constraints and lack of storage, MECO is unable to control this amount of penetration. As a result, millions of dollars in wind energy are curtailed and lost each year.

At other times of the day, energy can be very valuable. First, ancillary energy is needed when wind suddenly stops or a cloud covers the sun. Balancing out these short-term variations will

increase the potential for more renewable energy on the grid and greatly improve stability as discussed above. Second, peak power is needed in the middle of the day and in the evening hours to meet increased demand. On the mainland, cost for such power runs as high as 40-60 cents/kWh.

Storage can fill this gap, but utilities are understandably reluctant to invest into storage because of high costs and unknown technology. The other option is to let the renewable energy developers install storage, even though a utility location would be a better choice. However, wind farms sell energy at such low rates that make it impossible to invest in large amounts of storage. However, the price differential between the discarded energy and the high price for ancillary energy presents an excellent opportunity for a storage developer.

A storage developer can reliably earn money by buying the formerly discarded energy at a low price and feeding it into the grid at a higher price. Let's have an educated guess that 40 million kWh/year get curtailed in Maui and the Big Island. If the BFIT rate is 25 cents higher than the purchase price, earnings will be $10 million per year. Within a 20 year contract, earnings are $200 million.

A BFIT will create great opportunity for storage developers and bring forward a number of proposals if it is priced right. Financing, technology and performance risks are carried by the developer. At the current stage of development, this is the prudent way, rather than to burden the ratepayer with those risks.

To calculate the appropriate Feed-in Tariff, it is assumed that the battery gets charged fully at night and discharged during the day and has a lifetime of 20 years. This will be equivalent to 7,300 cycles. The capacity, purchase price and financing cost for the system determine the feed-in tariff rate. A rate between 20 and 30 cents above the energy purchase cost seems appropriate

given typical costs of $1 million per 1,000 kWh of storage. Such a rate would save the ratepayer money, as compared to the cost of running standby generators.

Technical issues, such as location, interconnection, sizing and discharge rates will need to be evaluated project by project through an interconnection study paid for by the project developer. The proposed FIT includes language for storage installations. CEM strongly recommends the inclusion of the BFIT in the initial FIT in order to make progress in the stability of the island grids possible.

The issue of limits, caps and goals

Germany's FIT does not have any caps on renewable energy and successful FITs throughout the world have followed its example. There are two valid objectives for the inclusion of caps. The first is the elimination of technical risks such as grid instability. The second is the avoidance of overproduction of renewable energy.

In regards to technical risks, CEM's position is to leave engineering problems to the engineers and not have administrative guesses as to the maximum project size or maximum grid capacity. The engineering issues need to be separated from the FIT obligations. This can be done by requiring the developer of larger systems to provide interconnection studies to prove that a certain project can be accommodated by the grid at a reasonable cost, before the utility is obligated under the FIT to purchase it's output. If Hawaii wants to rapidly switch to renewable energy, there is no reason to exclude suitable projects of any size. In particular, firm energy sources like biomass, geothermal, hydro, CSP with storage, etc. should not be limited in size. They may need to be configured so that they provide similar grid services to the fossil-fuel generators they displace.

In regards to overproduction of renewable energy (a happy problem), this needs to be addressed by limiting the FIT to the amount of energy required by the demand per island according to time of day. CEM's position is that this issue is as yet unsolved and a worthwhile problem to be solved in a future FIT upgrade.

Low-heat Geothermal

CEM presents in Appendix B the proposal of Southland Community Development Corporation as an example for a scalable low-heat geothermal technology that could be installed on several islands. This is one example of geothermal technologies that should be included in a FIT.

Baseline FIT

CEM recommends the inclusion of a baseline FIT, which allows new non-fossil technologies to be connected to the grid. By offering a low rate it will produce ratepayer savings as soon as new technologies are installed.

ANSWERS TO NRRI QUESTIONS

I. Caps and cost containment mechanisms

A. Should the Commission determine a total "budget" for FiT purchases? Should this budget be in terms of a total amount of dollars in cost that ratepayers should incur to support these purchases, or in terms of a total quantity of purchases? Or both? Over what period of time should this budget apply?

No. The Commission should not determine a total "budget" or expenditure cap for FiT purchases because such an expenditure cap would destroy the cost-effectiveness of the FIT by creating revenue uncertainty for renewable generation project development both above and below the cap, driving up the cost of capital for such development, and reducing the amount and speed of such development

B. In determining a budget, how should the Commission quantify the value of indirect (e.g. security, environmental and business development) benefits of the FiT?

In determining whether to establish a total budget or expenditure cap, the Commission should quantify the value of the energy security benefit, which is the direct and primary benefit of the FiT, in the manner used in Zero Emission's cost-benefit analysis which values the energy security benefit at $.40/kWh.

C. What should be the appropriate relationship between (a) the Commission's decision in the present FiT proceeding, and (b) the Commission's decision in the CESP proceeding (where it will determine an integrated strategy for reducing fossil fuel use)? Focusing on the parameters of cost and quantity of renewables purchased under an FiT, is it necessary or desirable for the Commission to make all decisions now (prior to the CESP outcome); or is it more desirable for the Commission to view its present decision in this FiT proceeding as a beginning, to be revisited once the CESP proceeding provides a clearer view about which measures produces the greatest returns, in terms of cost-effective fossil fuel use reduction?

The Commission should make a decision now, in the present FiT proceeding, establishing a true feed-in tariff, like Intervenors' FiT, that is uncapped by size, annual quantity or annual expenditure limits, other than the economically justifiable grid penetration limits in Intervenors' FIT. The Commission should not wait to make a decision in the CESP proceeding before making a decision to establish a true feed-in tariff because CESP is unlikely to ever result in "an integrated strategy for reducing fossil fuel use" or "a clearer view about which measures produces the greatest returns, in terms of cost-effective fossil fuel use reduction."

CESP is just a new name for Integrated Resource Planning (IRP). In 17 years of IRP, the utilities and the Consumer Advocate failed to come up with an integrated strategy for reducing fossil fuel use

D. Concerning the budget cap:

1. If the Commission adopts a cost-based cap, how should it mathematically define "cost"?

If the Commission adopts a cost-based cap, the Commission should define "cost" as the product of the quantity of renewable energy delivered to the utility (or the quantity of renewable energy that would have been delivered but for curtailment) times the applicable FiT rate.

a. If included in the cost calculation, how should the Commission define "avoided cost"?

"Avoided cost" should be included in the FIT cost-benefit analysis using the definition for "avoided cost" that the utility uses in reporting monthly "avoided cost" data to the Commission.

b. What additional ratepayer costs (e.g. administrative and contractual penalties) associated with the FiT should be included in the FiT cost calculation and how should they be determined?

Administrative and contractual penalties should not be included in the FiT cost-benefit analysis because such penalties should not be included in the FiT. Inclusion of such penalties in the FiT would vitiate the cost-effectiveness of the FiT by increasing the risks and, therefore, the costs of capital for developers of renewable generation projects. The only costs that should be borne by ratepayers are the costs of purchasing renewable energy at the FiT rate.

c. What direct benefits (e.g. reduced black-start costs) should be included in the FiT cost calculation and how should they be determined?

Distributed generation benefits, including reliability benefits like reduced black-start costs, are direct benefits that should be included in the FiT cost-benefit analysis.

2. If the Commission adopts cost-based caps, over what duration should the initial cap apply (e.g. annual caps or one cap until the next reevaluation)?

A cost-based expenditure cap serves no purpose other than to limit the amount, slow the speed and increase the cost to the public of renewable generation development.

3. If the Commission adopts cost-based caps, what should the initial cap be?

We do not recommend a cap.

4. If the Commission adopts quantity-based caps, how should it mathematically define "quantity" (e.g. installed capacity or projected kWh)?

If the Commission adopts a quantity-based cap, such as a cap on the amount of intermittent renewable generation that might be added to each island grid, any such cap should be defined in megawatts (MW) of installed capacity.

5. If the Commission adopts quantity-based caps, over what duration should the initial cap apply (e.g. annual caps or one cap until the next reevaluation)?

If the Commission adopts a quantity-based cap, such as the grid penetration cap for renewable generation proposed in Intervenors' FiT, the initial cap should apply until interconnection applications have been received for the initial cap amount, at which time the Commission should re-evaluate the economic basis for any increase in the cap amount.

6. If the Commission adopts quantity-based caps, what should the initial cap be?

If the Commission adopts quantity-based caps, the initial caps should be grid penetration caps equal to 25% of island-wide peak load for wind generation and 20% of island-wide peak load for solar generation.

E. How should the Commission allocate any cost or quantity caps among technologies, project sizes and islands (e.g. no restrictions or carve-outs)?

The Commission should allocate any grid penetration quantity caps for intermittent renewable generation on the basis of percentage of island-wide peak load for each island.

F. Should FiT rates increase based on milestones, decrease based on milestones, or remain constant between periodic reexaminations? What milestones?

FIT rates should remain constant between periodic reexaminations. It is highly probable that reexaminations will find that technology costs have decreased and that the FIT rate should be lowered. In Germany this leads to continuous technical advancement.

II. Reliability considerations

A. Should the Commission require the utility to propose, for Commission approval, transparent reliability standards that the utility would apply to determine:

1. when additional intermittent generation can or cannot be added to islands or circuits without compromising system security, and

No. Existing reliability standards (i.e., Rule 14H) are adequate for utility determination whether additional intermittent generation can or cannot be interconnected to island grids without compromising grid security.

2. if specific renewable energy projects would compromise system security?

No. Existing reliability standards (i.e., Rule 14H) are adequate for utility determination whether interconnection of specific renewable energy projects would compromise grid security.

B. Should the Commission require an independent monitor to oversee the utility's reliability determinations as related to the FiT?

Yes. CEM strongly advocates the establishment of an outside entity to organize the development of renewable energy in Hawaii. This entity should have deep understanding of both the grid limitations and the properties of renewable energy projects in order to help to resolve conflict and support or carry out interconnection studies.

III. FiT eligibility

A. Which technologies should be eligible for the initial FiT?

Commercially proven renewable energy generation technologies should be eligible for the initial FiT. In addition there should be a baseline FIT for all other carbon-free technologies.

1. Please identify the technologies you believe should be eligible, and why.

The following technologies should be eligible for the initial FiT because they are commercially proven:

Biomass and biogas
Geothermal energy
Landfill gas or sewage treatment plant gas
Hydropower
Photovoltaic
Concentrating solar
Onshore wind
Offshore wind

2. For technologies or technology/size combinations without Hawaii commercial experience, how can the Commission obtain or estimate reliable cost and performance information to calculate FiT rates?

For technologies or technology/size combinations without Hawaii commercial experience, the Commission can obtain or estimate reliable cost and performance information from foreign jurisdictions that have established FiTs which have led to successful development of projects using such technologies or technology/size combinations.

3. Should hybrid projects using biofuels be eligible for the FiT if biofuels are not included in the initial FiT?

Yes for indigenously produced biofuels.

4. Should hybrid projects using conventional fuels be eligible for the FiT? If so, should all of the energy produced by such projects receive FiT rates?

No. Hybrid projects using conventional fuels should not be eligible for the FiT because a FiT that includes imported fossil fuels or imported biofuels would not move Hawaii more decisively and irreversibly toward indigenously produced renewable energy.

B. What sizes of projects should be eligible for the initial FiT?

Projects of all sizes should be eligible for the initial FiT, subject only to island-wide grid penetration caps for intermittent renewable generation and aggregate intermittent generation caps equal to island-wide peak load for each island. However, for larger projects, the project developer needs to provide an interconnection study that proves that the project will not adversely impact grid reliability.

C. Should existing Schedule Q or negotiated PPA projects be eligible for the FiT?

Yes. Existing Schedule Q and negotiated PPA projects using renewable energy technologies otherwise eligible for the FiT should be eligible for the FiT if the Commission concludes that the cost to ratepayers of renewable energy from such projects under the FiT over the next 20 years is likely to be no more than the cost to ratepayers of such energy under Schedule Q or the existing PPAs over the next 20 years.

1. If existing projects are eligible for the FiT, how, if at all, should the term of the FiT differ from those offered to new projects (e.g. take into account years of prior operation)?

If the Commission decides that existing projects should be eligible for the FiT because the cost to ratepayers under the FIT is likely to be no more than the cost to ratepayers under Schedule Q or existing PPAs over the next 20 years, the term of the FiT offered to such projects should be 20 years and should not differ from the FiT term offered to new projects.

2. If existing projects are eligible for the FiT, how, if at all, should the FiT rates differ from those offered to new projects?

If the Commission decides that existing projects should be eligible for the FiT because the cost to ratepayers under the FIT is likely to be no more than the cost to ratepayers under Schedule Q or existing PPAs over the next 20 years, the FiT rate offered to such projects should not differ from the FiT rate offered to new projects.

D. Should the FiT be available for incremental additions to existing projects?

Yes.

E. Under what conditions, if at all, should utility affiliate-owned projects be eligible for the FiT?

Utility affiliate-owned projects should be eligible for the FiT, provided that (1) the utility, as a transmission & distribution entity, is obliged to take, purchase and pay for renewable energy delivered by the utility affiliate on the same terms as renewable energy delivered by an independent renewable energy generator, and (2) the Commission establishes a queuing procedure for interconnection priority that is uniformly applicable to projects owned by the utility affiliate and projects owned by independent renewable energy generators.

IV. Setting rates

A. What costs should the FiT cover (e.g. only the most cost-effective projects, typical projects or most projects)?

The FiT rates should be based on typical project costs, plus a return sufficient to induce rapid development of large-scale renewable generation.

B. What should the rate of return be for FiT projects?

The rate of return for FiT projects should be sufficient to induce rapid development of large-scale renewable generation at low cost to the ratepaying public. CEM believes that a rate of 8% should be enough in the current situation. However, as the financial markets change, the commission should be ready to adjust the rate to make projects possible.

1. How, if at all, should the returns for different projects reflect varying risks and cost of capital for different technologies?

The returns for different projects naturally will reflect varying risks and costs of capital for different technologies used by such projects. Different FiT rates should be set for different technologies and different project sizes, as they are under Intervenors' FiT, to reflect varying costs, including varying costs of capital, for different technologies, to reflect returns adequate to compensate investors for project development risks, and to induce rapid development of large-scale renewable generation at low cost to the ratepaying public and maximum benefit to the general public.

2. Should the implied returns in the FiT decline over time?

The implied returns in the FiT should decline over time if the Commission establishes and maintains a true feed-in tariff like Intervenors' FiT that is not limited by size caps, expenditure caps or quantity caps, other than the island-wide grid penetration limits for intermittent renewable generation and the island-wide peak load limit for aggregate renewable generation contained in Intervenors' FiT. If the Commission establishes and maintains a true feed-in tariff, the implied returns demanded by investors should decline over time as costs of capital decline over time because investors perceive diminished policy risks over time.

C. What information should the Commission use to determine the initial FiT rates (e.g. based only on Hawaii-specific information, based on adjusted mainland information or based on European FiTs)?

To determine the initial FiT rates, the Commission should use: (1) information about PPA rates that have proven sufficient to induce investment in renewable energy projects in Hawaii (such as the PPA rates for the PV projects developed by Hoku Solar to provide solar electricity to the Airports Division of the Hawaii Department of Transportation), (2) information about PPA and FiT rates that have proven sufficient to induce investment in renewable energy projects on the mainland United States and Puerto Rico, and (3) information about FiT rates that have proven sufficient to induce investment in renewable energy projects in places such as Europe, Canada, Brazil and the Caribbean. Real-Estate Appraisers usually use several different methods and average the results. This could be a reliable procedure for the commission as well.

D. If the Commission decides to calculate FiT rates based on cost and performance information, who should gather and analyze Hawaii-specific cost information (e.g. HECO or an independent consultant)?

If the Commission decides to calculate FiT rates based on cost and performance information, the Commission should gather and analyze Hawaii-specific cost information, possibly with the help of an independent consultant.

E. If the Commission decides to calculate FiT rates based on cost and performance information, what formula (e.g. the DCF formula proposed by HECO) should be used to determine FiT rates?

To determine FiT rates, the Commission shoulduse information about PPA and FiT rates that have proven successful in Hawaii and elsewhere in attracting investment in large-scale

renewable generation, and then use discounted cash flow (DCF) analysis based on cost and performance information to determine the likely cost-effectiveness of the proposed FiT rates.

F. If the Commission adopts a tiered approach (i.e., non-complicated projects receive an FiT rate and simplified processes while complicated projects receive an FiT rate and non-simplified processes), as discussed in the FiT hearing, should the IRS studies be mandatory for large but not small projects?

No. IRS studies should not be mandatory for any projects on the basis of project size. IRS studies should be required only for projects where the utility and/or the developer has a reasonable basis for believing that interconnection of the project would create a non-trivial risk to the safety or reliability of the grid.

1. Should the utility pay for any IRS studies for small projects?

Yes. The utility should pay for IRS studies for small projects, as shown in the "Interconnection Costs" table in CEM' Proposal for Feed-in Tariff at Appendix 1.

2. Should the utility pay for any IRS studies for large projects?

No. The utility should not pay for IRS studies for large projects as shown in the "Interconnection Costs" table in CEM' Proposal for Feed-in Tariff at Appendix 1.

3. Should the utility pay for, or compensate through FiT rates, any project-side modifications and/or additional requirements resulting from the IRS study for small projects?

Yes. The utility should pay for project-side modifications and/or additional requirements resulting from IRS studies for small projects, as shown in the "Interconnection Costs" table in CEM' Proposal for Feed-in Tariff at Appendix 1.

4. Should the utility pay for, or compensate through FiT rates, any project-side modifications and/or additional requirements resulting from the IRS study for large projects?

Yes. The utility should pay for project-side modifications and/or additional requirements resulting from IRS studies for large projects, as shown in the "Interconnection Costs" table in CEM's Proposal for Feed-in Tariff at Appendix 1.

G. How should the FiT rates consider accelerated depreciation?

The FiT rates should not consider accelerated depreciation because accelerated depreciation has little value other than to certain kinds of investors (widely-held C corporations and recipients of net passive income) that are not limited by US passive activity rules.

H. How should the FiT rates consider state tax credits?

The FiT rates should not be discounted to reflect Hawaii state tax credits. A project should not be eligible to receive the FiT rate if the project owner receives the Hawaii renewable energy technology income tax credit.

I. Should FiT projects be eligible to receive non-tax benefits from state or utility programs (e.g. rebates)?

Yes. An FiT project should be eligible to receive non-tax benefits such as rebates from state or utility programs if the project qualifies under the terms of those programs.

J. Should the FiT rates for new projects automatically adjust for changes in federal or state tax credits?

No. FiT rates for new projects should not be automatically adjusted for changes in federal or state tax credits because the actual financial effects of such changes might depend on subjective interpretations of the law. Creating a set of automatic adjustments for such changes would likely be a complex task because the actual financial effects of such changes would be difficult to predict at any time before the changes come into effect.

K. Should the FiT assume any residual value for the projects at the conclusion of the FiT?

No. For purposes of setting the FiT rate, the FiT should not assume any residual value for the projects at the conclusion of the FiT because any assumption by the Commission about residual value 20 years in the future would be entirely speculative.

1. How should the Commission determine any residual value for the projects at the conclusion of the FiT?

The Commission should not determine any residual value for the projects at the conclusion of the FiT because any determination by the Commission of residual value 20 years in the future would be entirely speculative.

2. How should projects be compensated for energy sales after expiration of their FiT term if FiT rates include, or exclude, an imputed residual value? Should the Commission address this issue now, or later?

Later. Inflation will make it very desirable to extend the FIT contract.

L. Should the initial FiT rates be time-differentiated?

The initial FiT rates should not be time-differentiated because time-differentiation of FiT rates, in the absence of a well thought-out system of time-differentiated rates applicable to all energy purchases by the utility, would be likely to add to the complexity and impair the cost-effectiveness of the FiT.

M. Should different FiT rates be created for each island?

Different FiT rates for each island should be created for PV solar and CSP, and should not be created for other renewable energy technologies, as shown in Intervenors' FiT.

N. How should initial FiT rates account for reliability benefits or lack there of from certain projects?

Initial FiT rates for renewable generation should not account for reliability benefits or lack of such benefits from certain projects and/or technologies because reliability benefits are a return to the utility and ratepayers, not to the project developer. If, however, the Commission wants to encourage especially rapid development of firm or dispatchable renewable generation projects that provides reliability benefits, the Commission might set initial FiT rates which incorporate a premium for technologies and project sizes that provide such reliability benefits. The Commission should set an initial FiT rate for energy storage technologies, as shown in

CEM' Proposal for Feed-in Tariff at Appendix 1, to induce the development of energy storage projects that provide such reliability benefits.

O. How should FiT projects be compensated for curtailment?

Under Intervenors' FIT, projects should be compensated at FiT rates for all renewable energy that would have been generated and delivered to the utility but for curtailment.

P. What baseline rates, if any, should the Commission provide for technologies without FiT rates?

For non-commercially proven technologies, the Commission should provide a baseline FiT rate equal to the lowest of the FiT rates for commercially proven technologies having their own FiT rates.

Q. How should the FiT rates account for inflation?

FiT rates should not account for inflation. FiT rates should be levelized over the 20 year FiT term. It is up to the project investor to decide whether the levelized FiT rate provides an adequate return based on the investor's inflation expectations.

However, changing conditions in the financial markets may make a reconsideration necessary. If a strong inflation sets in, interest rates will become too high to make investments in renewable energy profitable. In that case, the FIT may need to be reconfigured so that renewable energy investments become inflation-adjusted. That would create investment from investors interested more in capital preservation than earning interest.

R. When, if ever, should the FiT rates adjust mid-course for existing FiT projects (e.g. increases in curtailment or input costs)?

FiT rates should not be adjusted mid-course for existing FiT projects, with the possible exception of *force majeure* circumstances that include currency hyperinflation.

V. Process and non-rate terms

A. What should be the duration of the utility's obligation to buy under the FiT?

The duration of the utility's obligation to buy renewable energy under the FiT should be 20 years commencing with initial delivery of renewable energy to the utility.

B. When should the Commission first update the initial FiT, for application to future projects?

The Commission should first update the initial FiT on the second anniversary of the initial FiT, for application of the FiT to future projects.

C. After the first update, on what intervals should the Commission reexamine the FiT?

After the first update, the Commission should re-examine the FiT at intervals of 3 years.

D. In what situations, if any, should parties be able to petition for changes in the FiT between these previously scheduled reexaminations?

The Commission might consider allowing the parties to petition for changes in the FiT between re-examinations based on *force majeure* or extraordinary circumstances such as currency hyperinflation.

E. What cost and performance information should the Commission require that project developers provide for FiT projects?

The Commission should require that project developers provide information about the capital and operating costs of the project, and the kilowatt-hours of renewable energy generated by the project or that would have been generated by the project but for curtailment.

F. Concerning existing PPAs, for projects that do not switch to the FiT program: What, if any, compensation should they receive for curtailment, (a) arising from the introduction of FiTs or (b) that would have occurred without introduction of the FiTs? Does this question belong in this FiT case or does it belong in a case initiated by a project owner for revision of its existing PPA?

For existing PPA projects that do not switch to FiT rates, such projects should receive whatever compensation, if any, that is provided in the existing PPAs. Distinguishing curtailment arising from introduction of FiTs, from curtailment that would have occurred without the introduction of FiTs, would likely be a complex and contentious task. This question does not belong in this FiT case, but might belong in a case initiated by a project owner seeking revision of its existing PPA.

G. What queuing and interconnection processes should the utility utilize?

The utility should utilize an interconnection queuing process modeled after the first-ready, first-served queuing process of the Midwest ISO.

H. Should the Commission provide queuing priority for projects with reliability benefits?

Yes. In addition, the Commission might set initial FiT rates which incorporate a premium for technologies and project sizes that provide such reliability benefits.

I. Who should receive the value of RECs or other green attributes from FiT projects? How should an FiT rate reflect the answer to this question?

The rate payer.

J. Should prospective FiT-eligible projects have the right to apply for negotiated PPAs?

Yes. Prospective FiT-eligible projects should have the right to apply to the utility for negotiated PPAs, but such a right would be obsolete under a true FiT, like Intervenors' FiT, that has attractive FiT rates and that lacks size, quantity and expenditure caps other than economically-justifiable intermittent renewable generation and peak load caps contained in Intervenors' FiT.

K. What, if any, cost recovery assurance or other compensation should the utility receive in conjunction with the FiT?

The utility should be assured of cost recovery for its FiT renewable energy purchases (including payments for renewable energy that would have been generated and delivered to the utility but for curtailment), but cost recovery by the utility should not be a condition precedent for FiT payments to renewable generators or for enforceability of FiT contracts by renewable generators.

L. How should FiT costs be allocated between the HECO subsidiaries (and their ratepayers)?

FiT costs should be allocated between the HECO subsidiaries and their ratepayers based on the FiT energy purchases made by such subsidiaries.

M. Should the Commission explicitly reserve a right to at least temporarily halt the FiT program due to reliability or economic conditions that arise?

No. Reservation of a right to halt the FiT due to reliability or economic conditions would eliminate the interconnection certainty (for projects meeting the utility's interconnection requirements) and the price and revenue certainty that make the FiT an effective policy for encouraging rapid development of large-scale renewable generation at low cost to the ratepaying public for maximum benefit to the general public.

N. Should net metering be available for FiT-eligible projects?

Yes. Net energy metering (NEM) should be available for FiT-eligible projects if the project is also eligible for net energy metering. A customer-generator eligible for both FiT and NEM should have a one-time choice between FiT and NEM at the time that the project is placed in service.

O. Should the FiT be a contract or a tariff?

The FiT should be a tariff specifying, among other things, the utility's obligation to enter into a contract providing, among other things, for the utility's purchase of renewable energy at FiT rates and having the form attached as an exhibit to the FiT tariff.

P. Should FiT participants assume an obligation to sell power to the utility at FiT rates for the duration of the FiT term?

No. An obligation to sell renewable energy to the utility at FiT rates for the duration of the FiT term is unnecessary because the loss of revenue from a failure by the FiT participant to deliver renewable energy to the utility is penalty enough to ensure deliveries and sale of such energy to the utility at FiT rates for the duration of the FiT term.

VI. General

A. Does Section 269-27.2(b), HRS, empower the Commission to establish a set of feed-in tariffs that compel the utility to offer to purchase power from nonfossil producers at rates, terms and conditions established by the Commission, even if those rates, terms and conditions differ from those proposed by the utility in this proceeding?

Yes.

B. Does the Commission have authority to mandate that the utility procure a particular quantity of nonfossil electricity, exceeding the statutory RPS requirements? Can the Commission establish deadlines? What statutes grant this authority?

CEM does not know whether the Commission has authority to mandate that the utility procure a particular quantity of nonfossil electricity, exceeding the statutory RPS requirements. CEM does not know whether the Commission has authority to establish deadlines for such procurement. CEM does not know what statutes grant such authority.

C. Is the Energy Agreement legally binding on any one? In what way? Who could sue whom for noncompliance?

CEM does not believe that the Hawaii Clean Energy Initiative Agreement (the "HCEI Agreement") is legally binding on anyone because it is, on its face, a political accord setting an agenda for proposed regulatory and legislative proposals. CEM believes that, if one of the parties or a third-party beneficiary to the HCEI Agreement were to ask a court to enforce the HCEI Agreement, the court would lack jurisdiction to enforce the HCEI Agreement because enforcement of the HCEI Agreement would present a political question. CEM does not believe that any of the parties to the HCEI Agreement may sue any of the other parties to the HCEI Agreement for noncompliance with the HCEI Agreement.

D. Does the Commission have authority to adopt FiTs in this proceeding without having completed a proceeding on Clean Energy Scenario Planning?

Yes. CEM is not aware of any statute, regulation or order requiring the Commission to open or complete a Clean Energy Scenario Planning proceeding.

E. Under a FiT regime, will there still be a need for a contract between seller and the utility buyer? What form would these written contracts take? What seller obligations should these contracts cover?

Under a FiT regime, a contract between seller and utility buyer is not necessary, but may be useful for specifying all material aspects of the legal relationship between seller and utility buyer. These written contracts generally would take the form of the Schedule FiT Agreement attached as Appendix I to the HECO Companies' Straw Feed-in Tariff and modified to conform to Intervenors' FiT. These contracts generally should cover the seller obligations contained in the HECO Companies' Schedule FiT Agreement as modified to conform to Intervenors' FiT.

F. Assuming there are contracts associated with FiT sales, what is the Commission's statutory obligation to review these contracts? What are effective procedures to expedite Commission review?

The Commission has a statutory obligation to review contracts associated with FiT sales to ensure that the terms of such contracts, including the FiT rates, are just and reasonable and in the public interest. The Commission might consider appointing a third party reviewer to expedite Commission review of these contracts.

VII. Cost

A. Does HRS § 269-27.2 impose any limit on total cost?

No. HRS § 269-27.2 does not impose any limit on total cost.

For example:

1. Does the phrase "maximize the reduction in fossil fuels" in Section 269-27.2(b) allow the Commission to establish a quantity goal, determine the rate necessary to satisfy that goal, and impose that rate regardless of how high the rate is and regardless of total cost?

CEM does not know whether the phrase "maximize the reduction in fossil fuels" in HRS § 269-27.2 allows the Commission to establish a quantity goal and determine the rate necessary to satisfy that goal. CEM does not believe that this phrase allows the Commission to impose that rate regardless of how high the rate is and regardless of total cost, because the costs of that rate must be just and reasonable in relation to the benefits of that rate.

2. Does the "maximize" phrase mandate that result?

No.

3. If you believe the "maximize" phrase mandates that result, what effect does the discretionary term "may" have on the Commission's obligation?

CEM does not believe that the "maximize" phrase mandates that result.

4. Can the Commission determine a required quantity for the utility to purchase, and then set the rate at whatever level is necessary to attract that quantity? Would such a rate necessarily satisfy the just and reasonable standard?

CEM does not know whether the Commission can determine a required quantity for the utility to purchase, but does not believe that the Commission may set the rate at whatever level is necessary to attract that quantity if that rate is not just and reasonable to the ratepaying public. Such a rate would not necessarily satisfy the just and reasonable standard, but would satisfy the just and reasonable standard if the benefit of the quantity purchased was just and reasonable in relation to the purchase cost at that rate.

B. Regardless of any statutory limit on cost, does the Commission have authority to establish a dollar limit on the cost of utility acquisition of nonfossil electricity pursuant to an FIT? What statutes grant this authority?

CEM does not know whether the Commission has statutory authority to establish a dollar limit on the cost of utility acquisition of nonfossil electricity pursuant to an FiT.

C. Does this authority to establish a dollar limit apply only to acquisition above the quantities required by the RPS statute?

CEM does not know whether statutory authority to establish a dollar limit on the cost of utility acquisition of nonfossil electricity pursuant to an FiT applies only to acquisition above the quantities required by the RPS statute.

VIII. Sellers' Legal Rights

A. PURPA

1. Does a nonfossil developer have an existing statutory right, under state law or PURPA, to a negotiated PPA? If so, does that right continue even if the

Commission establishes FiTs that constitute utility offers to buy at a stated rate, or can the Commission make the FiT the exclusive means by which nonfossil producers sell to the utility? Put another way, if there is a FiT applicable to a particular seller, may the Commission authorize (or forbid) the utility to negotiate a PPA on terms that vary from the FiT?

CEM has no opinion on this issue.

2. Can the Commission substitute a FiT for Schedule Q, as a means of complying with PURPA? What type of issuance from the Commission would be necessary to demonstrate PURPA compliance?

CEM has no opinion on this issue.

B. Does HRS § 269-27.2 create any legal rights in sellers of nonfossil power?

CEM believes that, if the utility has agreed to purchaser power from a seller of nonfossil power, HRS § 269-27.2 gives the seller a legal right to sell such power at a rate that is not linked to the price of fossil fuel.

For example:

1. Does the phrase "just and reasonable rate" in HRS § 269-27.2(c) mean "just and reasonable" to the seller, or only "just and reasonable" to the consumer? That is, does the phrase "just and reasonable rate" allow a seller to contest a Commission-established FiT on the grounds that the rate is too low or that non-rate terms and conditions are unfavorable?

CEM has no opinion on this issue.

2. On what specific grounds could the seller contest the rate? That the rate produces a return on equity too low to attract sellers? How would the seller prove this case, to the Commission and to reviewing courts? What data would the Commission have to rely on to insulate its rate decision from judicial reversal? What evidentiary burden does the seller have, to supply facts to the Commission so that the Commission has the necessary factual support for its decision?

CEM has no opinion on this issue.

3. If the Commission declined to establish any FiT rates, but instead authorized the utility to self-produce or purchase renewables as the utility deems appropriate, would the sellers have any legal claim against the utility or the Commission? If the answer is no, then do the sellers have any legal right to contest a Commission-established FiT?

CEM has no opinion on this issue.

C. Assuming the Commission establishes FITs, may the Commission authorize (or forbid) sellers with existing PPAs to terminate the PPA and enter into an agreement under the FIT? Under what conditions? With what Commission involvement?

CEM has no opinion on this issue.

D. Hawaii statutes prohibit undue discrimination in the provision of utility service. How does that prohibition apply in the context of FiTs?

CEM believes that the statutory prohibition of undue discrimination in the provision of utility service does not apply in the context of FiTs because FiTs apply to the acquisition of renewable energy by the utility, not the provision of utility service to utility customers.

For example:

1. Can there be different rates for different technologies/sizes/islands: What factual differences are necessary to justify rate differences?

Yes. There can be different rates for different technologies, different project sizes, or different islands. Factual differences necessary to justify rate differences might include different costs for different technologies, different project sizes, or different islands.

2. Can there be negotiated PPAs that make use of FiT rates but that vary from each other in other terms and conditions?

Yes.

3. Can there be a negotiated PPA for projects that qualify under the scope of an existing FIT?

Yes. There can be a negotiated PPA for a project that qualifies under the scope of an existing FiT, but this possibility does not alter the utility's obligation to enter into the form of Schedule FiT Agreement attached as an exhibit to the FiT and conforming to Intervenors' FiT if the seller does not want to negotiate a PPA with the utility for the project that qualifies under thee scope of the existing FiT.

IX. Utility Role

A. Does the Commission have the power to restrict the utility's ability to build its own nonfossil generation, such as requiring the utility to refrain from building whenever there is a viable independent seller offering to sell? What findings must the Commission make to support such a restriction?

CEM has no opinion on this issue.

B. Same question as above, but applied to a utility affiliate selling renewable energy to another utility affiliate.

CEM has no opinion on this issue.

DATED: Kihei, Hawaii, June 12, 2009.

CHRIS MENTZEL
CEO, Clean Energy Maui LLC

APPENDIX A

PROPOSED FEED-IN TARIFF

CEM's proposed FIT is identical to Zero Emission's FIT as filed June 12, 2009 with the commission. It is not reprinted here in order to conserve resources.

APPENDIX B

LOW-HEAT GEOTHERMAL

A proposal by Southland Community Development Corporation.

1.0 Introduction

President Barack Obama has incorporated into his first budget significant financial commitments for economic revitalization based on alternative energy redevelopment and infrastructure. This funding is in addition to the currently available tax credit programs for various forms of renewable energy. Using both public and private sources, the 501(c)(3) nonprofit corporation Southland Community Development Corporation (the "Company") is prepared to develop for the State of Hawaii a comprehensive geothermal energy infrastructure that, given sufficient distribution and transmission resources, is capable of creating energy independence for the entire State.

2.0 Disadvantages of Previous Geothermal Systems

The Company will utilize patent-pending technology to eliminate the disadvantages of previous geothermal systems. Disadvantages of this approach are as follows:

- Gaseous emissions

- Water pollution
- Solid emissions
- Noise pollution
- Induced seismicity
- Induced landslides
- Extreme water usage
- Disturbance of natural hydrothermal manifestations

3.0 Summary of Improved Technology

The Company and its partners have developed technology applications for the construction of geothermal plants that significantly improve upon the adverse impacts of existing geothermal systems.

- The improvements developed and patent-pending are cost effective, have minimal environmental impact, and use existing resources and technology.
- The improved technology requires the use of only one bore hole. The reduction of, at a minimum 50%, of the drilling costs makes the construction of the proposed facility much more cost-effective.
- The improved technology uses heat conductive fluids in a completely sealed closed loop system. The heat conducting fluids are not released into the environment.
- There is no disturbance of natural hydrothermal manifestations and no requirement for extreme amounts of water.
- A completely closed loop process eliminates gaseous and solid emissions.

- The resulting carbon footprint is zero (other than the footprint produced in the construction materials of the plant)
- Elimination of the water reservoir in the EGS system also eliminates the seismic instability and other ecological problems of the two-well EGS approach.
- Using a single well system, depleted and dry wells can be converted into energy producing assets, which is not possible using current two-well technology.

4 Scalable Technology

4.1 Advances in heat conductive cementous grout

Heat conductive cementous grout is an advanced heat transmitting material. Technically, it is a "plasticized cementous thermally conditioned grout" and it has numerous applications in the construction industry. Tests conducted by DOE, Brookhaven National Laboratory, Sandia National Laboratories, Oklahoma State University and the State of New Jersey, have all shown cementous grout to be far superior to current grout products in such key areas as resistance to contraction, resistance to de-bonding, thermal conductivity and non-toxicity. Further, as stated in a DOE and Brookhaven technical report on geothermal heat pump applications: "The results confirmed the advantages of our optimized formulation in different geologies and climactic conditions and will give designers justification to specify the grout on future projects." The conductive grout used in the proposed system transfers heat up to 50% more efficiently than competing grouts. In fact, engineers estimate that when the advanced grout is used to fill in a bore hole, there will only be a minimum difference between temperature at the bottom and temperature at the top. This is a tremendous advantage in geothermal energy applications. The

grout is a commercial product that has been used successfully in commercial projects throughout the U.S.

4.2 United Technologies Corporation PureCycle® Geothermal Power System.

The second technology advance is United Technologies Corporation's ("UTC") PureCycleR Geothermal Power System. This geothermal power system generates a net 240 kilowatts with zero fuel, allows remote monitoring, is hermetically sealed, has a zero carbon footprint (in operations, not including materials used to assemble), is factory assembled and tested, requires no on-site support staff, and needs a temperature of only 195 degrees Fahrenheit to operate. This low temperature of the PureCycleR is extremely important to this business model. By operating at 195°oF when other geothermal power systems need 300°oF, PureCycleR makes it possible to profitably convert shallower wells into electric producers than would otherwise be possible. The generator is so efficient that well temperatures in excess of 225oF will allow for the use of multiple generators at minimal incremental cost. PureCycleR is currently in commercial operation in Alaska. It provides all the electricity for a hotel 32 miles away from the nearest electrical grid, including all the buildings, a greenhouse and a year-round ice museum.

4.3 Potential Power Production and Cost

The proposed program is scalable to any size, from a single generator operating on a single well, to multiple generators operating on multiple wells to generate as much power as required. While the power is baseload, it is also switchable to meet peak and off-peak demands. The State has explored introduction of electric vehicles once electric power generation is available at $0.10 per

kilowatt-hour. The geothermal power system proposed herein would produce electrical power for the State at $0.10/kilowatt-hour in order to further strategic infrastructure requirements.

5.0 Summary

The proposal contained herein is for scalable, switchable, baseload electrical power production for the State of Hawaii. Without appropriate inter-island transmission capability, this implementation would be initially limited to the geothermal zones of Maui and the Big Island for cost effectiveness. Whether transmission or deeper wells would be more cost-effective is a subject for future study. While current equipment lifetimes are approximately forty years, the existing natural resource of geothermal heat is sufficient for the foreseeable future and certainly throughout the century.

CERTIFICATE OF SERVICE

I hereby certify that I have this date filed and served the original and eight copies of the foregoing **CLEAN ENERGY MAUI'S OPENING BRIEF AND PROPOSED FEED-IN TARIFF** in Docket No. 2008-0273,

by mail delivery to the Commission at the following address:

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I hereby further certify that I have this date served two copies upon the following party of the foregoing **CLEAN ENERGY MAUI'S OPENING BRIEF AND PROPOSED FEED-IN TARIFF** in Docket No. 2008-0273, by mail addressed to:

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I hereby further certify that I have this date served one copy upon each of the following parties, of the foregoing **CLEAN ENERGY MAUI'S OPENING BRIEF AND PROPOSED FEED-IN TARIFF** in Docket No. 2008-0273, by causing each such copy thereof to be sent via e-mail in a portable document format ("pdf") to each such party as follows:

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